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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,320	04/10/2001	Edmund H. Crane III	35718/214291 (5718-183)	8792
27310	7590	11/19/2003	EXAMINER	
PIONEER HI-BRED INTERNATIONAL INC. 7100 N.W. 62ND AVENUE P.O. BOX 1000 JOHNSTON, IA 50131			KUBELIK, ANNE R	
			ART UNIT	PAPER NUMBER
			1638	

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/832,320	Applicant(s) CRANE ET AL.	
	Examiner Anne R. Kubelik	Art Unit 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendments filed 30 June 2003 have been entered. Claims 1-14 are pending. Claim 9 is withdrawn. Claims 1-8 and 10-14 are examined.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Withdrawn Objections and Rejections

3. The objection to claims 1-3 and 10-11 because of informalities is withdrawn in light of Applicant's amendments to the claims.
4. The rejection of claims 1-8 and 10-13 under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention is withdrawn in light of Applicant's stating that the strain will be irrevocably and without restriction or condition released to the public upon the issuance of a patent.
5. The rejection of claims 1-2 and 4 under 35 U.S.C. 102(b) as being anticipated by Ryals et al (WO 95/19443) is withdrawn in light of Applicant's amendment to claim a nucleic acid with 95% identity to SEQ ID NO:1 or 3.
6. The rejection of claims 1-8 and 10-13 under 35 U.S.C. 102(b) as being anticipated by Bloksberg et al (1998, US Patent 5,850,020) is withdrawn in light of Applicant's amendment to claim a nucleic acid with 95% identity to SEQ ID NO:1 or 3.

Claim Rejections - 35 USC § 112

7. Claims 1-8 and 10-13 remain rejected and claim 14 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rejection is repeated for the reasons of record as set forth in the Office action mailed 27 March 2003, as applied to claims 1-8 and 10-13. Applicant's arguments filed 30 June 2003 have been fully considered but they are not persuasive.

Applicant urges that Dayhoff et al, which was incorporated by references into the specification, provides guidance for making amino acid substitutions that do not affect biological activity and that conservative substitutions may be preferable. Furthermore, Applicant urges that Lazar shows that even conservative substitutions dramatically affected one amino acid position, as would be expected for an amino acid absolutely conserved at that position. Applicant urges that sequence-searching algorithms can be used to identify homology to known proteins (response pg 10-11).

This is not found persuasive. Amino acid conservation does not provide guidance for making amino acid substitutions. Hill et al, cited in the prior Office action, teach that when three histidines that are maintained in ADP-glucose pyrophosphorylase across several species are substituted with the "nonconservative" amino acid glutamine, there is little effect on enzyme activity, while the substitution of one of those histidines with the "conservative" amino acid arginine drastically reduced enzyme activity (see Table 1). Thus, amino acid substitution requires trial and error experimentation, which given the size of the protein encoded by SEQID NOs:1 and 3 would require making and analyzing up to 19^{203} nucleic acids just for single amino acid substitutions. Dayhoff could not be considered because it was not sent.

Applicant urges that an alignment sent with the response shows the high similarity of SEQ ID NO:2 to PR1 proteins from Arabidopsis, maize and tobacco and is evidence of the membership of SEQ ID NO:2 in the PR-1 gene family (response pg 11).

This is not found persuasive. Town et al (2003, GenBank Accession No. NP_201460) was published after the filing date of the instant applicant and as such cannot be relied upon for enablement of the instant application. Additionally, the identification of that protein as a PR-1 protein is only putative; there is no evidence that it actually encodes such a protein. Examiner also notes that in the electronically scanned version of Applicant's response the green and yellow highlighting of amino acids is not apparent.

Furthermore, claim 1 is drawn to an isolated nucleic acid with 95% identity to SEQ ID NO:1 or 3. SEQ ID NO:1 is 898 nucleotides long and SEQ ID NO:3 is 612 nucleotides long. A nucleic acid with 95% identity to SEQ ID NO:1 would have 45 nucleotide substitutions, and could encode a protein with up to 45 amino acid substitutions; this protein would have 77.8% similarity to SEQ ID NO:2. A nucleic acid with 95% identity to SEQ ID NO:3 would have 30 nucleotide substitutions, and could encode a protein with up to 30 amino acid substitutions; this protein would have 85.2% similarity to SEQ ID NO:2. The specification does not describe proteins with 77.8% or 85.2% identity to SEQ ID NO:2.

The specification provides no assay for "PR1-C10 activity" and it is not clear what this activity is. Pg 39, lines 27-29, of the specification provides examples of PR1-C10 like activity, as participation in the pathogenic response and enhancement of disease resistance, but PR1-C10 like activity is not defined and the nature of the participation or enhancement is not detailed. A great many proteins participate in the pathogenic response and enhance disease resistance, but these proteins have very different specific activities (Delaney, 1997, Plant Physiol. 113:5-12, see

Table 1 and Figure 2). The specification does not teach which of these, or other possible activities with a role in the pathogenic response and disease resistance, is PR1-C10 activity. Furthermore, the lack of activation in response to elicitor or spore treatment suggests that SEQ ID NO:2 does not play a role in pathogen defense.

Lastly, antisense constructs that are not completely homologous to the target gene can have very unpredictable effects. Colliver et al (1997, Plant Mol. Biol. 35:509-522) showed that transformation of bird's foot trefoil with a construct that was antisense to bean chalcone synthase resulted in transformants with *increased* levels of chalcone synthase transcripts (pg 519, left column, paragraph 2) and note other instances when this phenomenon has occurred (pg 519, right column, paragraph 1).

8. Claims 1-8 and 10-13 remain rejected and claims 14 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The rejection is repeated for the reasons of record as set forth in the Office action mailed 27 March 2003, as applied to claims 1-8 and 10-13. Applicant's arguments filed 30 June 2003 have been fully considered but they are not persuasive.

Applicant urges that in view of the amendments to the claims, and the arguments presented in response to the enablement rejection, the specification provides an adequate written description of the inventions as it is now claimed (response pg 12).

This is not found persuasive because "PR1-C10 activity" is not defined. Furthermore, as discussed above, the specification does not describe proteins with 77.8% or 85.2% identity to SEQ ID NO:2.

9. Claims 1-8 and 10-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. Dependent claims are included in all rejections. The rejection is modified from the rejection set forth in the Office action mailed 27 March 2003, as applied to claims 1-8 and 10-13, due to amendment of the claims. Applicant's arguments filed 30 June 2003 have been fully considered but they are not persuasive.

Claim 1 is indefinite in its recitation of "PR1-C10 activity" in line 2, respectively. The term has no meaning in the art, and is not defined in the specification.

Claims 10 and 14 are not written in proper Markush format. The claims should be in the format "selected from the group consisting of A, B, C and D." See MPEP § 2173.05(h). The phrase --the group consisting of-- needs to be inserted after "from". Additionally, there needs to be more than one member of the group. Claim 1 is drawn to only one nucleic acid molecule. Lastly, there is a lack of antecedent basis for the limitation "the isolated nucleic acids of claim 1".

10. Claims 1-8 and 10-14 are free of the prior art, given the failure of the prior art to teach or suggest an isolated nucleic acid with 95% identity to SEQ ID NO:1 or 3 or encoding SEQ ID NO:2.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, whose telephone number is (703) 308-5059. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9307 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Customer Service at (703) 308-0198.

Anne R. Kubelik, Ph.D.
November 4, 2003

A handwritten signature in black ink, appearing to read "Amy Nelson", is positioned above the typed name and title.

AMY J. NELSON, PH.D
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600